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Centre Number

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Student Number

**2016
PRELIMINARY EXAMINATION**

Mathematics General

General Instructions

- Reading time – 5 minutes
- Working time – 2 hours
- Write using blue or black pen
- Calculators may be used
- Write your Centre Number and Student Number at the top of this page, page 11 and on the multiple-choice answer sheet provided

Total marks - 80

Section 1 Pages 2 - 9

20 marks

- Attempt Questions 1 - 20
- Allow about 30 minutes for this section

Section 11 Pages 11 - 24

60 marks

- Attempt Questions 21 - 24
- Allow about 1 hour and 30 minutes for this section

**2016 PRELIMINARY EXAMINATION
MATHEMATICS GENERAL**

Section I

20 marks

Attempt Questions 1 – 20

Allow about 30 minutes for this part

Use the multiple-choice answer sheet provided for Questions 1-20

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample $2 + 4 =$ (A) 2 (B) 6 (C) 8 (D) 9

A B C D

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A B C D

If you have changed your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word *correct* and drawing an arrow as follows:

A B ^{correct} C D

1 The Spark family noticed that their electricity bill had risen from \$784 to \$941. Calculate the increase as a percentage of the original bill. Answer to the nearest percentage.

- (A) 17%
- (B) 20%
- (C) 83%
- (D) 120%

Disclaimer

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2 Given $v = u + at$, find the value of v correct to 1 decimal place, if $u = 7.35$, $a = 0.02$ and $t = 6.8$.

- (A) 7.486
- (B) 7.49
- (C) 7.4
- (D) 7.5

3 0.8% per month interest is equivalent to which of the following interest rates: (answers are correct to 3 decimal places)

- (A) 9.600% per annum
- (B) 0.026% per day
- (C) 0.185% per week
- (D) All of the above

4 Sonja buys a pair of boots and a coat at MARCS during the winter sale, for a total of \$480. The boots are normally \$290.

What is the normal price of the coat?

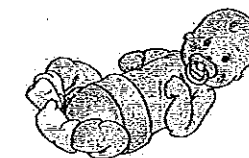
MARCS Winter Sale
 25% of all footwear
 20% off all coats

- (A) \$190
- (B) \$217.50
- (C) \$262.50
- (D) \$328.13

5 An event that occurred 27 times has a relative frequency of 0.3. How many trials were performed in this experiment?

- (A) 9
- (B) 8.1
- (C) 90
- (D) 27

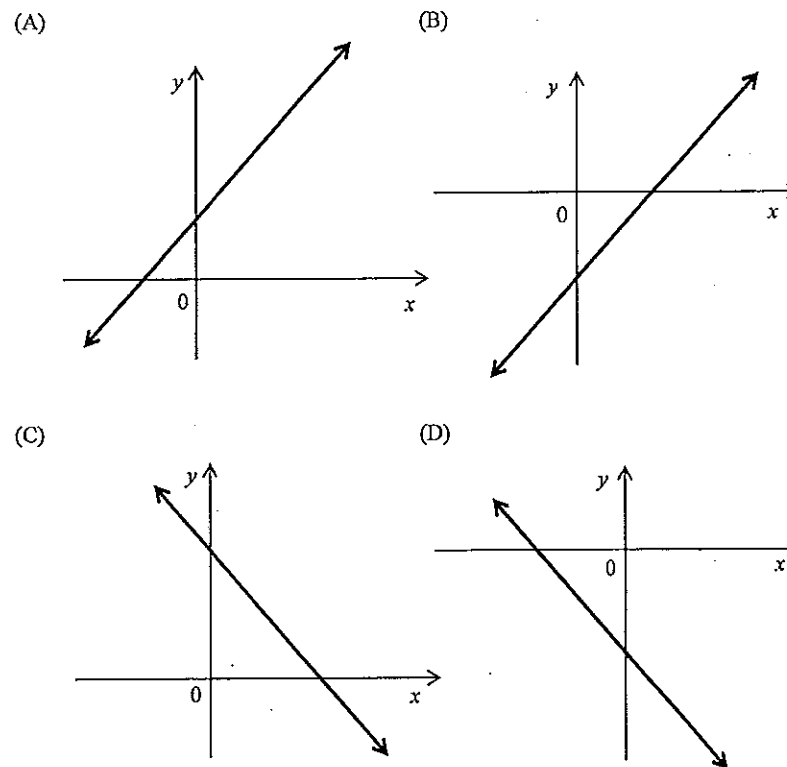
6 A baby's weight is measured to be 2.88 kg.



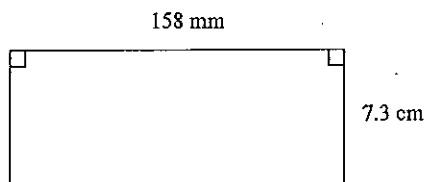
Which of the following statements is not correct?

- (A) The precision of the weight measurement is ± 0.08 kg
- (B) The absolute error of the weight is ± 0.005 kg
- (C) The relative error of the weight ± 0.0017 kg
- (D) The percentage error of the weight is $\pm 0.17\%$

7 Which of these graphs could represent the line $y = 3 - 2x$?



- 8 Determine the perimeter of the figure shown.



- (A) 330.6 mm
(B) 46.2 cm
(C) 33.06 cm
(D) 115.34 cm
- 9 Expand and fully simplify $15 - 2(x + 6)$.

- (A) $15 - 2x - 12$
(B) $3 - 2x$
(C) $13x - 78$
(D) $13x - 19$

- 10 Charlotte works part time at a fast food outlet and is paid at a rate of \$15.70 per hour. On Sundays she is paid double time. Calculate her pay for a week in which she works 9 hours during the week and 6 hours on Sunday.

- (A) \$471.00
(B) \$266.90
(C) \$329.70
(D) \$235.50

- 11 The number 5 726 400 written in correct scientific notation is:

- (A) 5.7264×10^6
(B) 57.264×10^5
(C) 5.7264
(D) 5.7264×1000000

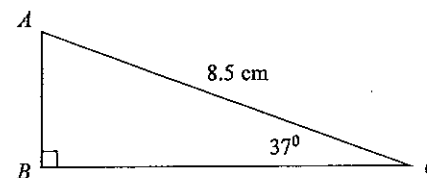
- 12 Examine this data display.

11	5 8
12	0 2 6
13	1 1 2 3 4 7 9 9 9 9
14	0 0 1 2 5 5 8
15	2 4 7 8
16	1

Which of the following statements is NOT correct?

- (A) The mode is 139.
(B) The median is 137.
(C) The range is 46.
(D) The display is called a stem-and-leaf plot.

- 13 Select the correct operation to calculate the length of side AB.



- (A) $AB = 8.5 \times \sin 37^\circ$
(B) $AB = 8.5 \times \cos 37^\circ$
(C) $AB = \frac{8.5}{\sin 37^\circ}$
(D) $AB = 37 \times \tan 8.5^\circ$

- 14 Victoria works as a casual in a supermarket. She is paid \$17.20 per hour, and if she works on a Sunday she is paid at the time and a half rate. One week, Victoria worked for 5 hours on Wednesday, and was called in to work on Sunday. She was paid \$189.20 in total.

How many hours did she work on Sunday?

- (A) 6 hours
 (B) 11 hours
 (C) 5 hours
 (D) 4 hours

- 15 Dale analyses a set of data and produces this 5 number summary:

6, 11, 22, 30, 35

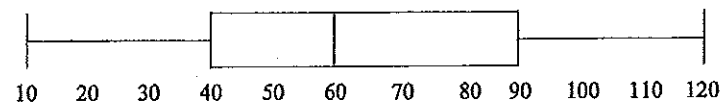
Which of the following is definitely a correct statement about the data set?

- (A) Range = 29 Interquartile Range = 19
 (B) Mean = 20.8 Range = 29
 (C) Median = 22 Interquartile Range = 20.5
 (D) Mode = 6 Median = 35

- 16 Which of the following is equal to the fraction $\frac{3}{8}$?

- (A) 38%
 (B) 37.5%
 (C) 3.8
 (D) $\frac{8}{3}$

- 17 The times, in minutes, that a large group of students spend on exercise per day are presented in the box-and-whisker plot.



What percentage of these students spend between 40 minutes and 60 minutes per day on exercise?

- (A) 17%
 (B) 20%
 (C) 25%
 (D) 50%

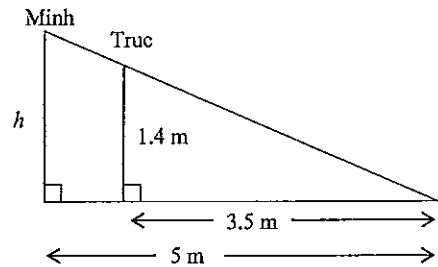
- 18 Pat invests \$15 000 in a bank account which earns 6% p.a. interest calculated quarterly. Which of the following calculations should Pat use to get the future value of the investment after 3 years?

- (A) $15000(1.06)^3$
 (B) $15000(1.06)^{12}$
 (C) $15000(1.015)^{12}$
 (D) $15000(1.015)^3$

- 19 An octahedron die has eight faces, numbered 1 to 8. When the die is rolled once, what is the probability that it lands on an even number greater than 3?

- (A) $\frac{1}{8}$
 (B) $\frac{3}{8}$
 (C) $\frac{1}{4}$
 (D) $\frac{1}{3}$

- 20 The diagram shows that Minh and his sister Truc are standing side by side. Truc is 1.4 m tall and casts a shadow 3.5 m long. How tall is Minh if his shadow is 5 m long?



- (A) 1.2 m
- (B) 3.3 m
- (C) 3.8 m
- (D) 2.0 m

**2016 PRELIMINARY EXAMINATION
MATHEMATICS GENERAL**

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Centre Number

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Student Number

Section II

60 marks

Attempt Questions 21-24

Allow about 1 hour and 30 minutes for this part

Answer the questions in the spaces provided.

Show all relevant working in questions involving calculations.

Question 21 (15 marks)

(a) Solve the following equation: $5(m-2) + 7 = 3m + 11$

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(b) Clarissa purchases a luxury car for \$87 500. She is told the value of the car will depreciate annually a rate of 28% of its current value.

Use the declining balance method to determine the value of the car after 3 years.

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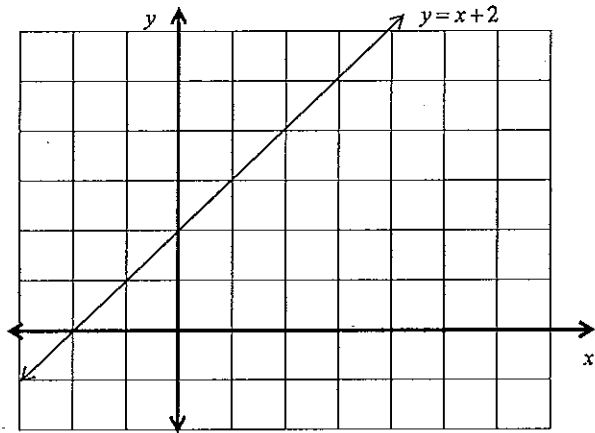
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Question 21 continues over the page

Question 21 (continued)

(c) The graph of $y = x + 2$ is shown on the number plane below.



(i) On the same number plane, sketch the straight line $y = -\frac{x}{2} + 5$.

2

You may complete the table of values provided to help you.

x	-1	0	1	2	3
y					

(ii) Write down the coordinates of the point of intersection of $y = x + 2$ and $y = -\frac{x}{2} + 5$.

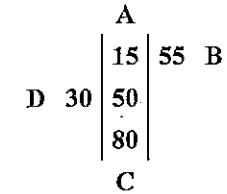
1

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Question 21 continues over the page

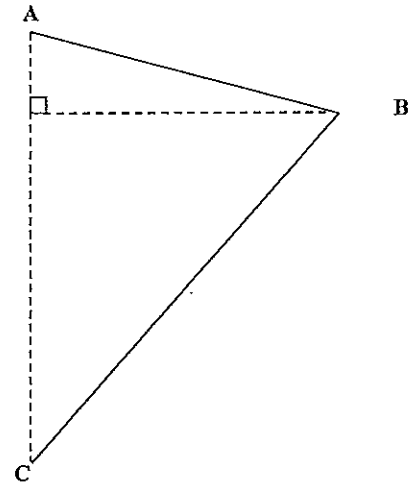
Question 21 (continued)

(d) A surveyor made the following notebook record of a piece of land.



(i) Use a ruler to complete the diagram started for you below using the scale 1 cm = 10 m.

1



(ii) Show working to calculate the length of BC in metres correct to 1 decimal place.

2

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Question 21 continues over the page

Question 21 (continued)

(e) A motorbike was purchased for \$7 200 and valued 12 months later at \$6 050. Express the decrease in value as a percentage of the purchase price, to the nearest percent.

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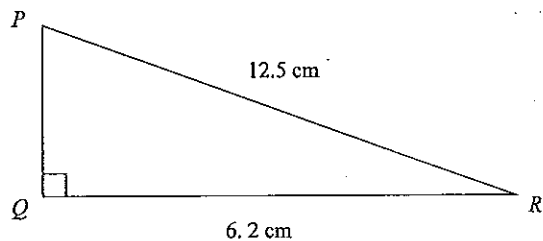
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(f) Calculate the angle PRQ correct to the nearest degree.

2



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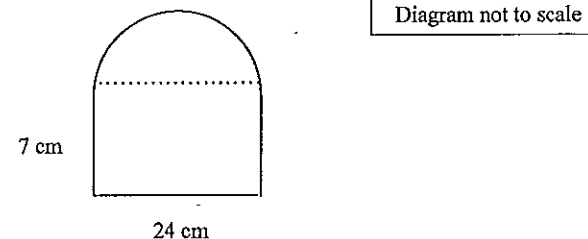
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End of Question 21

Question 22 (15 marks)

(a) The composite shape below is made from a rectangle and a semi-circle. Calculate the perimeter of the shape correct to the nearest centimetre.

3



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(b) The number of standard drinks in a container can be calculated using the formula:

$$N = 0.789 \times V \times A$$

N = the number of standard drinks

V = the volume of the container in litres

A = the percentage of alcohol (% alc/vol) in the drink

Calculate the number of standard drinks in a 750 mL bottle of red wine with an alcohol content of 14% alc/vol. Answer correct to the nearest whole number.

2

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Question 22 continues over the page

Question 22 (continued)

(c) Demi wants to buy a new car which has a purchase price of \$58 725.

She is offered finance terms of 15% deposit of the purchase price, and monthly repayments of \$1 351.90 for 5 years.

To purchase the car (whether with cash or using finance terms) she must pay the following fees:

Registration \$1 720

Insurance \$1 295

Stamp Duty \$2 935

(i) How much deposit does Demi pay?

1

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(ii) How much would she pay in total to own the car if she paid the cash price rather than finance terms?

2

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(iii) How much extra would she pay by purchasing on finance terms?

2

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Question 22 continues over the page

Question 22 (continued)

(d) The following cumulative frequency table shows the results of a class test out of 15.

Score (x)	Frequency (f)	Cumulative Frequency (cf)
9		5
10		9
11		16
12		18
13		20
14		28
15		32

(i) Complete the frequency column on the table above.

1

(ii) Find the mean score of this set of data.

2

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(iii) Determine the median score.

2

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End of Question 22

Question 23 (15 marks)

(a) A mobile phone company charges according to the table below.

Charges for the Plans are calculated every 30 days.

Call costs	\$50 PLAN	\$60 PLAN	\$80 PLAN	\$100 PLAN
Standard voice/video calls to standard Australian numbers (per 30 second block)	65 cents per 30 second block plus 40 cents call connection fee			Unlimited
Text to standard Australian numbers	Unlimited			
MMS to standard Australian numbers	50 cents			Unlimited
MessageBank connection fee (per call)	40 cents	Unlimited		
MessageBank retrieval (per 60 second block)	90 cents	Unlimited		
Excess data usage (charged per MB)	25 cents per MB			

(i) Tiana is on the \$50 Plan. How much will she be charged for one 15 minute phone call?

1

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(ii) If Tiana rings her mother 3 times per month and speaks for 15 minutes, would she be better off on the \$100 Plan? Assume the plans are charged every 30 days. Support your decision with calculations.

2

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Question 23 continues over the page

Question 23 (continued)

(b) A 56 kg woman wants to keep her $BAC \leq 0.05$. How many full standard drinks can she consume in 3 hours to remain under 0.05?

3

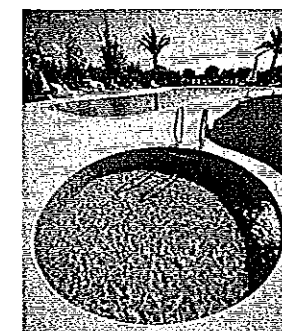
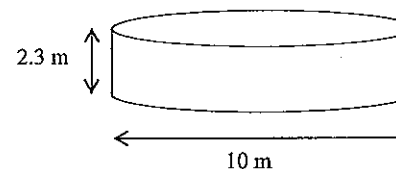
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(c) A circular swimming pool has a diameter of 10 m and a depth of 2.3 m.



(i) Calculate the volume of the swimming pool to the nearest m^3 .

2

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(ii) Calculate the number of litres of water required to fill the pool. Answer to the nearest litre.

1

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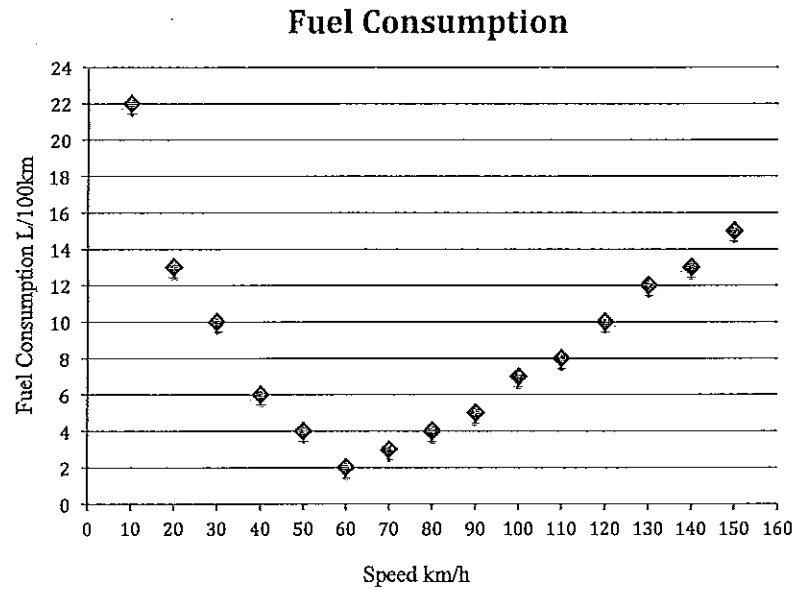
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Question 23 continues over the page

Question 23 (continued)

(d) The scattergraph shows the number of kilometres a car can travel per litre of petrol at different speeds.



(i) At approximately what speed is the car most efficient? 1

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(ii) A car has a full tank of 50 litres. If it travels at an average speed of 80 km/h, how far can it travel on one full tank? 2

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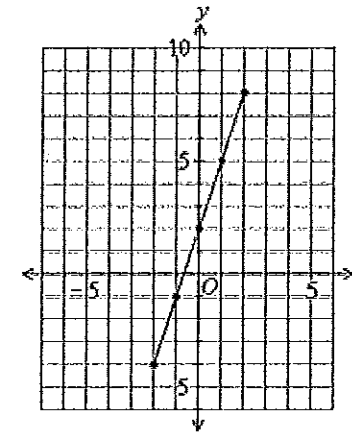
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Question 23 continues over the page

Question 23 (continued)

(e) The graph below shows a straight line.



(i) Find the gradient of the line shown on the graph. 1

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(ii) Write down the y -intercept. 1

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(iii) Write down the equation of the straight line shown above. 1

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End of Question 23

Question 24 (15 marks)

(a) Stamp duty is payable on the purchase of a car and is payable according to the following scale:

<i>Price of Car</i>	<i>Stamp Duty Payable</i>
Up to and including \$45 000	\$3 per \$100 or part thereof of the value of the car
Over \$45 000	\$1350 plus \$5 per \$100 or part thereof of the value of the car over \$45 000.

Jordan and Shane both buy cars. Jordan buys a car for \$43 500. Shane buys a car for \$48 250.

What is the difference in the stamp duty they pay?

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(b) A survey was conducted among a sample of year 12 students in a high school about whether the school uniform should include long pants for girls. The results are shown below.

	Boys	Girls	Total
Long pants	12	89	101
No Long pants	37	2	39
Total	49	91	140

(i) How many boys surveyed did not want girls to be able to wear long pants?

1

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(ii) What percentage of students are in favour of allowing girls to wear long pants? Answer to the nearest percent.

1

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Question 24 continues over the page

Question 24 (continued)

(iii) Comment on why this survey is not a good random sample of all students at the school.

1

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(c) Sam has a 2TB USB drive she uses to store her movies.

(i) Convert 2 TB into MB.

1

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(ii) How many movies of size 625 MB will the USB drive be able to hold?

1

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(iii) Sam wants to download a 625 MB movie. How long will it take to download the movie if the download speed is 990Kbps? Answer to the nearest minute.

2

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Question 24 continues over the page

Question 24 (continued)

(d) Taylor has an annual gross income of \$102 335 and earned \$12 770 from his investments this year. He has paid PAYE tax of \$43 798 to the Australian Taxation Office, and has allowable deductions totalling \$22 590. Taylor will need to pay a Medicare Levy of 1.5% on his taxable income.

(i) Calculate Taylor's taxable income.

1

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Tax rates 2015-16

The following rates for 2015-16 apply from 1 July 2015.

Taxable income	Tax on this income
0 – \$18,200	Nil
\$18,201 – \$37,000	19c for each \$1 over \$18,200
\$37,001 – \$80,000	\$3,572 plus 32.5c for each \$1 over \$37,000
\$80,001 – \$180,000	\$17,547 plus 37c for each \$1 over \$80,000
\$180,001 and over	\$54,547 plus 45c for each \$1 over \$180,000

(ii) Using the tax table provided, calculate Taylor's tax payable.

1

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(iii) Calculate the Medicare Levy that Taylor is required to pay.

1

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(iv) State whether Taylor will receive a tax refund, or incur a tax debt, and support your decision with calculations.

2

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End of Paper

2016 PRELIMINARY EXAMINATION

MATHEMATICS GENERAL – MARKING GUIDELINES

The sample answers indicate features that should be found in a response that receives full marks.

For the extended response questions, a set of guidelines is included rather than a sample answer.

Exam Section	Question	Marks	Answer
Section I	1	1	B
	2	1	D
	3	1	D
	4	1	D
	5	1	C
	6	1	A
	7	1	C
	8	1	B
	9	1	B
	10	1	C
	11	1	A
	12	1	B
	13	1	A
	14	1	D
	15	1	A
	16	1	B
	17	1	C
	18	1	C
	19	1	B
	20	1	D

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Exam Section	Question	Marks	Syllabus/Course Outcomes	Strand	Targeted Performance Bands	Answer
Section II	21 (a)	3	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM1	3	$m = 7$
	21 (b)	2	MPG-1, MPG-2, MPG-3, MPG-6, MPG-9, MPG-10	FM2	4	\$32 659.20
	21 (c) (i)	1	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM2	4	See solutions
	21 (c) (ii)	2	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM2	4	(2, 4)
	21 (d) (i)	1	MPG-2, MPG-3, MPG-4, MPG-5	MM2	3	See solutions
	21 (d) (ii)	2	MPG-2, MPG-3, MPG-4, MPG-5	MM2	3	$BC = 91.9 \text{ m}$
	21 (e)	2	MPG-1, MPG-6, MPG-9, MPG-10	FM1	4	16%
	21 (f)	2	MPG-2, MPG-3, MPG-4, MPG-5	MM3	4	$\angle PRQ = 60^\circ$
	22 (a)	3	MPG-2, MPG-3, MPG-4, MPG-5	MM2	5	76 cm
	22 (b)	3	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM1	5	8 standard drinks
	22 (c) (i)	1	MPG-1, MPG-6, MPG-9, MPG-10	FM1	3	\$8 808.75
	22 (c) (ii)	2	MPG-1, MPG-6, MPG-9, MPG-10	FM1	4	\$64 675
	22 (c) (iii)	2	MPG-1, MPG-6, MPG-9, MPG-10	FM1	6	\$31 197.75
	22 (d) (i)	1	MPG-1, MPG-2, MPG-7, MPG-9, MPG-10	DS3	3	See solutions
	22 (d) (ii)	2	MPG-1, MPG-2, MPG-7, MPG-9, MPG-10	DS3	4	12
	22 (d) (iii)	2	MPG-1, MPG-2, MPG-7, MPG-9, MPG-10	DS3	5	11.5
	23 (a) (i)	1	MPG-1, MPG-6, MPG-9, MPG-10	FM1	5	\$19.90
	23 (a) (ii)	2	MPG-1, MPG-6, MPG-9, MPG-10	FM1	6	Yes. See solutions
	23 (b)	3	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM1	5	3 standard drinks
	23 (c) (i)	2	MPG-2, MPG-3, MPG-4, MPG-5	MM2	4	181 m^3
	23 (c) (ii)	1	MPG-2, MPG-3, MPG-4, MPG-5	MM2	4	180 642 L (181 000 L)
	23 (d) (i)	1	MPG-1, MPG-2, MPG-7, MPG-9, MPG-10	DS3	3	60 km/h
	23 (d) (ii)	2	MPG-1, MPG-2, MPG-7, MPG-9, MPG-10	DS3	5	1250 km
23 (e) (i)	1	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM2	4	$m = 3$	

Exam Section	Question	Marks	Syllabus/Course Outcomes	Strand	Targeted Performance Bands	Answer
	23 (e) (ii)	1	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM2	3	$b = 2$
	23 (e) (iii)	1	MPG-1, MPG-2, MPG-3, MPG-9, MPG-10	AM2	3	$y = 3x + 2$
	24 (a)	3	MPG-1, MPG-2, MPG-3, MPG-6, MPG-9, MPG-10	FM2	6	\$210
	24 (b) (i)	1	MPG-1, MPG-2, MPG-7, MPG-10	DS1	4	37
	24 (b) (ii)	1	MPG-1, MPG-2, MPG-7, MPG-10	DS1	4	72%
	24 (b) (iii)	1	MPG-1, MPG-2, MPG-7, MPG-10	DS1	5	See solutions
	24 (c) (i)	1	MPG-2, MPG-3, MPG-4, MPG-5	MM1	5	2 097 152 MB
	24 (c) (ii)	1	MPG-2, MPG-3, MPG-4, MPG-5	MM1	4	3355 movies
	24 (c) (iii)	2	MPG-1, MPG-2, MPG-7, MPG-10	DS1	6	88 minutes
	24 (d) (i)	1	MPG-2, MPG-3, MPG-6, MPG-9	FM3	5	\$92 515
	24 (d) (ii)	1	MPG-2, MPG-3, MPG-6, MPG-9	FM3	4	\$22 177.55
	24 (d) (iii)	1	MPG-2, MPG-3, MPG-6, MPG-9	FM3	4	\$1 387.73
	24 (d) (iv)	2	MPG-2, MPG-3, MPG-6, MPG-9	FM3	6	Refund = \$20 232.72

Section II

Question 21 (15 marks)

21 (a) (3 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Marks
• Correct solution of $m = 7$	3
• Progress toward correct solution	2
• Correct expansion of $5(m-2) = 5m - 10$	1

Sample answer

$$5m - 10 + 7 = 3m + 11$$

$$5m - 3 = 3m + 11$$

$$2m = 14$$

$$m = 7$$

21 (b) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Marks
• Correct solution	2
• Use of correct formula	1

Sample answer

$$S = 87500(1 - 0.28)^3$$

$$= \$32659.20$$

21 (c) (i) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Marks
• Accurately constructed straight line	2
• Correctly completed table of values	1

Sample answer

21 (c) (ii) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Mark
• Both x and y values correct	1

Sample answer

(2, 4)

21 (d) (i) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 3

Criteria	Mark
• Accurately constructed location of point D	1

21 (d) (ii) (2 marks)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 3

Criteria	Marks
• Correct answer	2
• Evidence of the use of Pythagoras' Theorem	1

Sample answer

$$BC^2 = 65^2 + 55^2$$

$$BC = 85.1\text{m}$$

21 (e) (2 marks)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Marks
• Correct answer	2
• Calculation showing denominator of 7200	1

Sample answer

$$\frac{7200 - 6050}{7200} \times 100 = 16\%$$

21 (f) (2 marks)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 4

Criteria	Marks
• Correct answer	2
• Use of the cos ratio	1

Sample answer

$$\cos \angle PRQ = \frac{6.2}{12.5}$$

$$\angle PRQ = 60^\circ$$

Question 22 (15 marks)

22 (a) (3 marks)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 5

Criteria	Marks
• Correct answer	3
• Evidence of calculation of perimeter	2
• Evidence of use of circumference formula	1

Sample answer

$$P = 7 + 24 + 7 + \frac{1}{2} \times \pi \times 24$$

$$P = 76 \text{ cm}$$

22 (b) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 5

Criteria	Marks
• Correct answer	2
• Evidence of substitution into formula, but with $V=750$	1

Sample answer

$$N = 0.789 \times 0.75 \times 14$$

$$N = 8.28$$

There are 8 standard drinks.

22 (c) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Mark
• Correct answer	1

Sample answer

$$\text{Dep} = 15\% \times 58725$$

$$= \$8088.75$$

22 (c) (ii) (2 marks)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Marks
• Correct answer	2
• Evidence of addition of fees	1

Sample answer

$$\text{Total cash price} = 58725 + 1720 + 1295 + 2935$$

$$= \$64675$$

22 (c) (iii) (2 marks)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 6

Criteria	Marks
• Correct answer	2
• Correct amount for purchasing on finance terms	1

Sample answer

$$\text{Finance} = 1351.90 \times 12 \times 5 + 8808.75$$

$$= \$89922.75$$

$$\text{Extra} = 89922.75 - 58725$$

$$= \$31197.75$$

22 (d) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Mark
• All values in the column correct	1

22 (d) (ii) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Marks
• Correct value for the mean	2
• Evidence of calculations leading toward correct answer	1

Sample answer

$$\bar{x} = \frac{384}{32}$$

$$\bar{x} = 12$$

22 (d) (iii) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-9, MPG-10

Targeted Performance Bands: 5

Criteria	Marks
• Correct value for the median	2
• Evidence of calculations leading toward correct answer	1

Sample answer

$$\text{Median} = 11.5.$$

Question 23 (15 marks)

23 (a) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 5

Criteria	Mark
<ul style="list-style-type: none"> Correct answer 	1

Sample answer

$$\text{one call} = 0.4 + 0.65 \times 30$$

$$= \$19.90$$

23 (a) (ii) (2 marks)

Outcomes Assessed: MPG-1, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 6

Criteria	Marks
<ul style="list-style-type: none"> Correct answer supported by calculations 	2
<ul style="list-style-type: none"> Correct decision supported by incorrect calculation 	1

Sample answer

$$\text{Cost} = 19.90 \times 3$$

$$= \$59.70$$

She should move to the \$60 plan.

23 (b) (3 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 5

Criteria	Marks
<ul style="list-style-type: none"> Correct answer of no more than 4 drinks 	3
<ul style="list-style-type: none"> Correct calculation of $N = 4.145$ 	2
<ul style="list-style-type: none"> Correct substitution into correct formula 	1

Sample answer

$$0.05 = \frac{10N - 7.5 \times 3}{5.5 \times 56}$$

$$0.05 \times 308 = 10N - 22.5$$

$$10N = 15.4 + 22.5$$

$$10N = 37.9$$

$$N = 3.79$$

She should not drink more than 3 standard drinks.

23 (c) (i) (2 marks)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 4

Criteria	Marks
<ul style="list-style-type: none"> Correct answer 	2
<ul style="list-style-type: none"> Use of correct formula, or incorrect formula with correct value of radius 	1

Sample answer

$$V = \pi \times 5^2 \times 2.3$$

$$= 180.64$$

$$= 181\text{m}^3$$

23 (c) (ii) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 4

Criteria	Mark
<ul style="list-style-type: none"> Correct value for the capacity. Allow CFPA and 181 000 L 	1

Sample answer

$$\text{Capacity} = 180642 \text{ L.}$$

23 (d) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Mark
<ul style="list-style-type: none"> Correct answer 	1

Sample answer

$$60 \text{ km/h.}$$

23 (d) (ii) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-9, MPG-10

Targeted Performance Bands: 5

Criteria	Marks
<ul style="list-style-type: none"> Correct answer 	2
<ul style="list-style-type: none"> Progress towards the correct answer 	1

Sample answer

$$80 \text{ km/h uses } 4 \text{ L/100 km.}$$

$$50 \div 4 \times 100 = 1250 \text{ km.}$$

23 (e) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer	1

Sample answer

$m = 3$.

23 (e) (ii) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Mark
• Correct answer	1

Sample answer

$b = 2$.

23 (e) (iii) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-9, MPG-10

Targeted Performance Bands: 3

Criteria	Mark
• Correct expression for the straight line	1

Sample answer

$y = 3x + 2$.

Question 24 (15 marks)

24 (a) (3 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-3, MPG-6, MPG-9, MPG-10

Targeted Performance Bands: 6

Criteria	Marks
• Correct answer	3
• Correct value for Shane's duty	2
• Correct answer for Jordan's stamp duty	1

Sample answer

Jordan: $435 \times 3 = \$1305$

Shane: $450 \times 3 + 33 \times 5 = \1515

Difference: $1515 - 1305 = \$210$

24 (b) (i) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-10

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer	1

Sample answer

37.

24 (b) (ii) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-10

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer	1

Sample answer

$$\frac{101}{140} \times 100 = 72\%$$

24 (b) (iii) (1 mark)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-10

Targeted Performance Bands: 5

Criteria	Mark
• Comment should reference either age leading to differing opinions, or twice as many girls asked as boys	1

Sample answer

Different year groups will have different opinions depending on their age OR more girls than boys were asked leading to boys not being represented adequately.

24 (c) (i) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 5

Criteria	Mark
• Correct answer	1

Sample answer

$$2 \text{ TB} = 2 \times 1024 \times 1024$$

$$= 2097152 \text{ MB}$$

24 (c) (ii) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-4, MPG-5

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer (allow CFPA)	1

Sample answer

$$2097152 + 625 = 3355 \text{ movies.}$$

24 (c) (iii) (2 marks)

Outcomes Assessed: MPG-1, MPG-2, MPG-7, MPG-10

Targeted Performance Bands: 6

Criteria	Marks
• Correct answer	2
• Progress towards the correct answer	1

Sample answer

$$625 \text{ MB} = 625 \times 1024 \times 1024 \times 8$$

$$= 5242880000 \text{ b}$$

$$= 5242880 \text{ Kb}$$

$$\frac{5242880}{990} = 5295.8 \text{ s}$$

990

$$= 88 \text{ minutes}$$

24 (d) (i) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-6, MPG-9

Targeted Performance Bands: 5

Criteria	Mark
• Correct answer	1

Sample answer

$$\text{Taxable income} = 102335 + 12770 - 22590$$

$$= \$92515$$

24 (d) (ii) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-6, MPG-9

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer. Allow CFPA	1

Sample answer

$$\text{Tax payable} = 17547 + 0.37 \times (92515 - 80000)$$

$$= \$22177.55$$

24 (d) (iii) (1 mark)

Outcomes Assessed: MPG-2, MPG-3, MPG-6, MPG-9

Targeted Performance Bands: 4

Criteria	Mark
• Correct answer. Allow CFPA	1

Sample answer

$$\text{M.L.} = 0.015 \times 92515$$

$$= \$1387.73$$

24 (d) (iv) (2 marks)

Outcomes Assessed: MPG-2, MPG-3, MPG-6, MPG-9

Targeted Performance Bands: 6

Criteria	Marks
• Correct refund amount. Allow CFPA	2
• Addition of Medicare Levy and Tax payable	1

Sample answer

$$\text{Owing} = \text{Tax} + \text{Medicare Levy}$$

$$= 22177.55 + 1387.73$$

$$= \$23565.28$$

$$\text{Refund} = 43798 - 23565.28$$

$$= \$20232.72$$